

CLAIM(S):

1. A device server system comprising:
serial devices;
a device server for connecting the serial devices to a local area network;
driver software installed on a host computer with an operating system that is connected to a local area network, the driver software for directing serial port data onto the local area network; and
firmware installed on the device server for facilitating communication between the host computer and a selected one of the serial devices, wherein the firmware directs the serial port data received from the remote computer to the selected one of the serial devices, and wherein the firmware writes portions of the received serial port data to FIFO registers of the serial device, if a queue is empty, before writing remaining data of the received serial port data to the queue of the selected one of the serial devices.
2. The system of claim 1 wherein, when an application on the host computer invokes a function involving a serial device, the driver software transfers data intended for the serial device to a transport protocol of the host computer for transmission to the device server.
3. The system of claim 1 further comprising:
application software installed on the device server for handling device specific flags and timeouts.
4. The system of claim 1 wherein the device server has an operating system and the firmware application functions within the operating system.
5. The system of claim 1 wherein the FIFO registers are located in a serial chip associated with each serial device.

6. The system of claim 1 wherein the driver software utilizes a transport protocol to direct the serial port data onto the local area network.

7. The system of claim 6 wherein the local area network is an Ethernet network and wherein the transport protocol utilizes Ethernet hardware addresses to route the serial data over the local area network.

8. A system for connecting serial devices to a local area network comprising:

- a device server in communication with the local area network, the device server comprising:

- serial connectors for linking one or more serial devices to the device server;

- an operating system; and

- applications running on the operating system for coordinating communications between the operating system, the local area network network, and the serial device;

- a driver installed on a host computer and for mediating between host application software and host operating system software installed on the host computer, the host computer being in communication with the local area network, wherein the server driver transmits serial data from the host application software over the local area network to a selected serial device linked via one of the serial connectors to the device server;

- wherein the applications have a semi-blocking read function for transferring the serial data from a memory queue associated with the selected serial device to a buffer of the operating system.

9. The system of claim 8 wherein the semi-blocking read returns data to the applications on the device server as soon as data is available up to a predefined number of bytes.
10. The system of claim 8 wherein the driver on the host computer uses a transport protocol for transmitting the serial data over the local area network.
11. The system of claim 10 wherein the transport protocol is TCP.
12. The system of claim 10 wherein the local area network is an Ethernet network and wherein the transport protocol utilizes Ethernet hardware addresses to route the serial data over the local area network.
13. A system for connecting serial devices to a network, the system comprising:
 - host driver software installed on a host computer connected to the network, wherein the host driver software interfaces with host application software and host operating system software, the host operating system software having a serial port API with an intercharacter interval timer setting, and wherein the host driver software receives serial port data over the network using the serial port API.; and
 - a device server connected to the network and in electrical communication with one or more serial devices, the device server sends the serial port data over the network and measures an intercharacter interval corresponding to the intercharacter interval timer setting of the serial port API, and wherein the device server returns a flag to the host computer when the intercharacter interval exceeds a preset value.

14. A method for facilitating communication between a host computer and a serial device over a network, the method comprising:

transmitting data in a standard serial port format over a local area network to a selected serial device having a FIFO register and a queue;

receiving the data at a device server connected to the network, the device server having one or more serial ports connected to one or more serial devices, one of the one or more serial devices being the selected serial device;

storing the received data temporarily in a buffer;

reading the received data from the buffer;

writing the read data to the selected serial device, such that if the FIFO register is empty, the read data is written to the FIFO register until the FIFO register is full and the remaining data is written to the queue.

15. The method of claim 14 wherein the step of transmitting comprises:

encoding the data into frames; and

placing the frames onto the local area network.

16. The method of claim 14 wherein the serial devices are connected to the device server via serial cables.

17. The method of claim 14 wherein the step of transmitting comprises:

converting information from an application on the host computer into the data in the standard serial port format using a device specific serial driver;

transferring the data in kernel space on the host computer from a serial port buffer to a transport buffer using a server driver;

encoding the data in the transport buffer; and

transmitting the encoded data onto the local area network.

18. The method of claim 17 wherein the step of receiving comprises:
decoding a received encoded data; and
storing the decoded data in the buffer.
19. A method for eliminating synchronization latencies in a device server for facilitating communication between a host computer and a selected serial device, the method comprising:
transmitting data in a standard serial port format and a parameter for a desired intercharacter timer interval over a network link to a remote device server;
receiving the data and the parameter with the remote device server;
writing the data to the selected serial device;
measuring a time interval of the remote device server; and
returning a flag to the host computer if the time interval exceeds the parameter.
20. A method for facilitating communication between a host computer and a remote serial device, the method comprising:
transmitting serial data from an application on the host computer over a network link;
receiving the serial data from the network link with a device server;
storing temporarily the serial data in a buffer; and
transferring the serial data from the buffer to the remote serial device using a semi-blocking read mode function.
21. The method of claim 20, wherein the semi-blocking read returns data to the applications on the device server as soon as data is available up to a predefined number of bytes.